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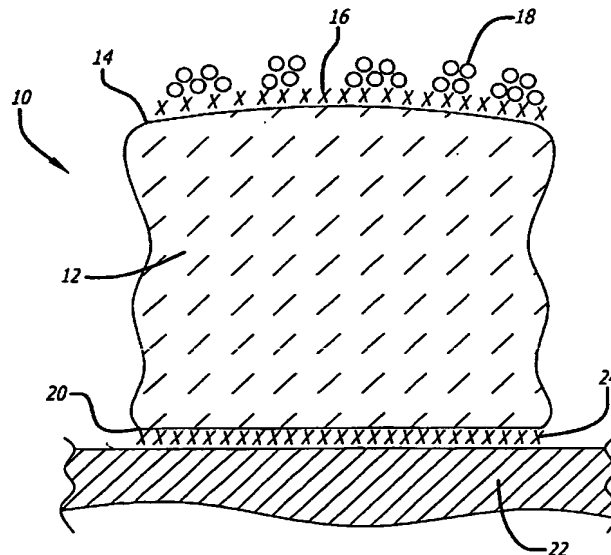
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[Continued on next page]

(54) Title: SUPPORTED METAL CATALYST WITH IMPROVED THERMAL STABILITY



(57) Abstract: Catalytic systems are provided that include a metallic catalyst attached to a ceramic support that has alumina as a principal ingredient. The ceramic support is doped with an adhesive agent so that the surface of the support includes the adhesive agent. The adhesive agent is designed to form an open-shell electronic structure at the interface between the metallic catalyst and the support. The open-shell structure promotes extended useful catalyst lifetimes. The adhesive agents are early transition metals that include titanium, zirconium, scandium, hafnium, lanthanum and yttrium. Doping of the ceramic support surface with the adhesive agent also increases the adhesion between the ceramic support and metallic monoliths to which the ceramic support may be attached.



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## INTERNATIONAL SEARCH REPORT

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|--|---|--|
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| Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)   |   |  |
| <b>C. DOCUMENTS CONSIDERED TO BE RELEVANT</b>  |   |  |
| Category*  | Citation of document, with indication, where appropriate, of the relevant passages  | Relevant to claim No.  |
| X  | US 6,165,934 A (GARDNER et al) 26 DECEMBER 2000, see entire document.   | 1-3, 5-11, 13-19, & 21-23  |
| A  | US 6,121,189 A (CAMPBELL et al) 19 SEPTEMBER 2000, see entire document.   | ALL  |
| A  | US 6,255,249 B1 (VOSS et al) 03 JULY 2001, see entire document.   | ALL  |
| A  | US 6,140,266 A (CORRIGAN et al) 31 OCTOBER 2000, see entire document.   | ALL  |
| A  | US 6,180,075 B1 (LINDNER et al) 30 JANUARY 2001, see entire document.   | ALL  |
| A  | US 6,248,689 B1 (MANSON) 19 JUNE 2001, see entire document.   | ALL  |
| <input checked="" type="checkbox"/> Further documents are listed in the continuation of Box C. <input type="checkbox"/> See patent family annex.   |   |  |
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|-----------|--|-----------------------|
| A         | US 6,294,140 B1 (MUSSMANN et al) 25 SEPTEMBER 2001, see entire document.           | ALL                   |
| A         | US 6,365,543 B1 (SCHMIDT et al) 02 APRIL 2002, see entire document.                | ALL                   |